

REMARKS

In order to expedite the prosecution of the present application, objected-to Claim 15 has been canceled and replaced by newly presented Claim 20 which contains the subject matter of Claim 15 in independent form. Accordingly, it is respectfully submitted that Claim 20 now is in condition for allowance.

In order to more particularly point out and distinctly claim the subject matter which Applicants regard as the invention, Claim 13 has been amended in order to state that the method of the present invention is directed to the manufacture of a quartz glass slab ingot from silica powder. No new matter has been added.

Claims 13 and 17-19 have been rejected under 35 USC 102(a) as being anticipated by Sayce et al I (U.S. 6 763 682) or under 35 USC 102(a) as being anticipated by Sayce et al II (WO 00/03955). Claims 14 and 16 have been rejected under 35 USC 103(a) as being unpatentable over Sayce et al I or Sayce et al II. Applicants respectfully traverse these grounds of rejection and urge reconsideration in light of the following comments.

The presently claimed invention is directed to a method of manufacturing a quartz glass slab ingot from silica powder which comprises the steps of providing a rotatable furnace having a feeder at a top portion thereof, dropping silica powder around the center of a furnace bed in the rotatable furnace through the feeder, fusing the silica powder in the rotatable furnace, depositing the fused silica at the center of the furnace bed and extending the fused silica deposited outwardly from the center of the furnace bed by heating and rotating the furnace.

As discussed previously, the instant invention enables the manufacture of a quartz glass slab ingot which can be in the form of a column, a solid round bar or a plate. Conventional methods do not supply silica powder to the center

of the furnace in that the flow of silica powder tends to interfere with the flow of hydrogen gas and, if the diameter of the quartz glass ingot exceeds 400 mm, the supply rate of silica powder is increased, which makes the gas flow turbulent and prevents the uniform dispersion of silica powder in the oxygen/hydrogen gas mixture. This results in the silica powder not being uniformly fused and the generation of bubbles inside the fused quartz glass, which damages the quality of the quartz glass. The prior art cited by the Examiner does not disclose the presently claimed invention.

The Sayce et al references disclose a method and apparatus for the manufacture of synthetic vitreous silica ingots which involves the production of a melt of synthetic vitreous silica in a crucible within a refractory furnace, and the continuous withdrawal of an ingot through an orifice in the wall of the crucible. The silica may be deposited in the crucible by a synthesis burner which can also maintain the silica above its sintering temperature.

The present invention is distinguishable over the Sayce et al references in that it is directed to a method of manufacturing a quartz glass slab ingot from silica powder. The Sayce et al references are concerned with the formation of synthetic vitreous silica glass. The burners disclosed in the Sayce et al references are not for melting silica powder but maintaining synthesized silica above its sintering temperature and at least burner is for synthesizing silica. An ingot is withdrawn through an orifice disposed at a bed of a furnace in the Sayce et al references at a rate substantially similar to the rate of the synthesis of the silica. The Sayce et al references exclude the used silica from being made by the fusion of refined natural quartz crystal powders and the present invention requires that silica powder be dropped around the center of a rotatable furnace bed, which is not disclosed in the Sayce et al references. In the Sayce et al references, a synthetic quartz glass ingot is withdrawn from the orifice downwardly to set the dimension of the ingot by

the configuration of the orifice. In contrast thereto, in the present invention, the fused silica powder extends horizontally by centrifugal force produced by rotating the furnace and the dimension of the silica ingot is defined by the cross-section of the furnace. As such, it is respectfully submitted that the presently claimed invention clearly is patentably distinguishable over the prior art references cited by the Examiner.

The Examiner is respectfully requested to reconsider the present application and to pass it to issue.

Respectfully submitted,


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